

EFFECTIVE REVENUE RECOVERY

SERVICE DELIVERY THAT PAYS

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Table of Contents

Synopsis	1
The Problem	1
Non payment for services	1
Theft of services through illegal and unsafe connections	1
Damage and theft of public infrastructure	1
Capacity management	1
Energy Shortfall in South Africa	1
Figure 1 - Current state of the Energy Shortfall in South Africa	1
Revenue Recovery	1
Methods to aid in Revenue Recovery and Service Management	1
Meter Operational modes	1
Theft prevention (guaranteed payment for consumption)	1
Demand Side Management (Equalize load based on Capacity)	1
Safety (Professional approach to service delivery)	1
The Power Process Solution	1
iControl Overview	1
iControl Components	1
Central operations	1
Reporting services	1
Alerting services	1
Administration system	1
Security services	1
iControl Overview	1
iControl Features	1
Product in this range	1

Synopsis

Power Process Systems has a method of ensuring revenue recovery through managed service delivery of electricity.

This method is a holistic solution that encompasses both “pay for services” and “Capacity (Demand side) Management” through effective application of secure, low cost remote metering and management.

The method delivers an easy platform to manage supply, from the simple “disk” meters, to the most sophisticated web enabled consumer devices.

Using the PPS methodology will ensure payment for energy supplied as well as the effective management of your meter infrastructure and services.

“Honestly Managed Energy”

The Problem

Non payment for services

1. Services are not billed correctly – causing payment issues
2. Payments are not made either willfully or due to financial difficulties
3. Enforcement is difficult to carry out against an individual consumer
4. Service personnel are in physical danger from certain communities if they attempt to remove service
5. Arbitrary cut off may impact civil & constitutional rights of consumers, especially if there is a life critical dependency on power supplies
6. Unmanaged cut off will increase the hardship of those affected

Theft of services through illegal and unsafe connections

1. Illegal connections endanger the lives of the immediate community
2. Service personnel cannot create any long term repairs as the damage reoccurs immediately
3. The illegal connection is not metered nor is it paid for
4. The illegal connection has not load limiting breakers or similar to protect life
5. Constant overload and abuse of the connection results in the surrounding feeder infrastructure being damaged leading to community dissatisfaction
6. A community solution is hard to implement due to costs of highly specialized equipment
7. Illegal connections take place prior to the metering point so true losses can only be averaged for any particular area.

Damage and theft of public infrastructure

1. Vandalism costs money to repair or replace public equipment

2. It also endangers lives in a community especially the vulnerable such as children.
3. The vandals will often destroy related services in the course of their activities.
4. Theft of components such as aluminum or copper or even just steel enclosures often drive these actions and leave communities without essential services.

Capacity management

1. Demand management cannot take place in a environment of illegal connections of continual non payment
2. Consumers cannot be educated in the traditional metering environment as there is no way to remotely interact with the supply
3. The scale of the problem is such that staff cannot be sent out to load shed consumers when capacity is being over utilized
4. Old technology meters and connections have no way of providing any “partial” supply, they will supply to the limit of the corresponding breaker
5. No view of individual, local or regional consumption is remotely available to enable proper planning and response strategies to be created.

Energy Shortfall in South Africa

The current energy shortfall in South Africa is exacerbated by no payment for services, effectively depriving electrical service providers the ability to service and maintain their networks. It also in-debts the service providers to the Primary suppliers such as Eskom limiting the available capital needed to expand supply capacity for National Growth.

The other hidden costs include the cost of personnel to perform functions such as:

1. Debt Collection
2. Supply disconnection
3. Repair and maintenance to abused public supply infrastructure such as metering kiosks, meters and other supply systems. This includes damage due to overloaded supply points that result in expensive burnt out equipment.

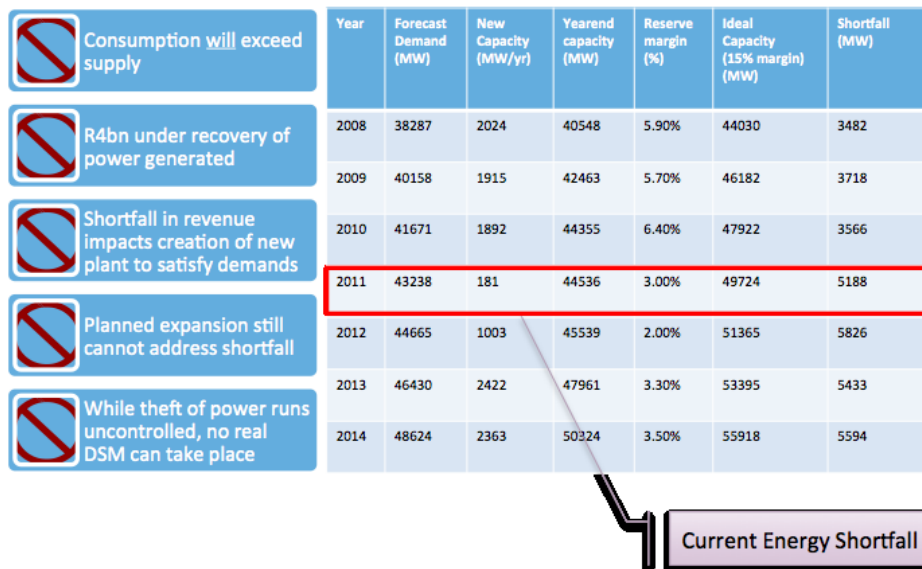


Figure 1 - Current state of the Energy Shortfall in South Africa

The net effect of these non-technical losses is that it places a huge strain on the economy of South Africa and as such is not sustainable into the future. Services consumed must be paid for where it is required and underlying costs and inefficiencies in the supply of services should be reduced substantially.

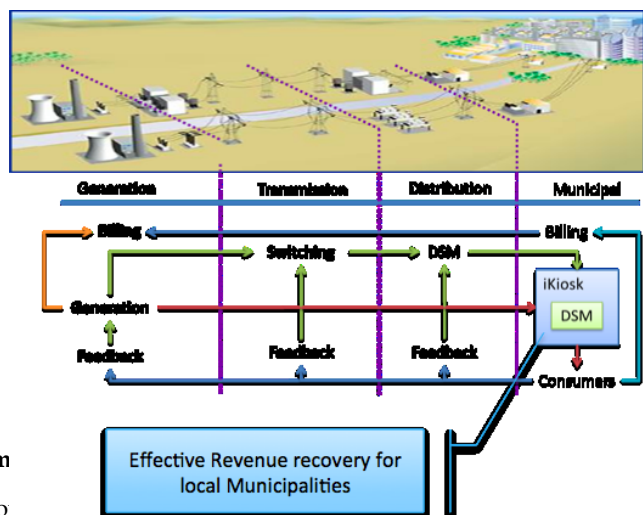
In addition, Demand Side Management Techniques that will help conserve our scarce resources cannot be applied while end consumers continue with non-payment and overloading of systems. The costs therefore have to be recovered somewhere, generally from those consumer who do pay. This ultimately is a spiral that will often result in the current good payers joining those that don't pay but rather steal services.

Revenue Recovery

The most effective way to recover revenue is at the consumer end of the Energy chain. Securing the metering phase of the delivery cycle is critical to avoid theft of limited energy & resources.

This is accomplished by:

1. Securely housing publicly exposed metering equipment.
2. Monitoring all metering equipment for tampering and bypass activities.
3. Monitoring all enclosures to detect tampering including unauthorized connections potentially facilitated by maintenance personnel.
4. Manage enclosure and system access to limit fraud and collusion.



Methods to aid in Revenue Recovery and Service Managem

Enhancing revenue management and collection and of impro

service delivery through centralized management of the following aspects:

Meter Operational modes

Utilize meters that support both Prepaid and Credit modes. This will allow consumers to choose the mode of operation of their service supply. This requires the use of expensive smart meters and may expose these meters to vandalism that will drive costs up. Use of this technology permits the service provider to also force some consumers to be pre-paid based on poor credit or payment history

Theft prevention (guaranteed payment for consumption)

Billing point inaccessible to consumer, ensure that the metering component of the supply cannot be tampered with. Use a split device that allows the consumer to manage the supply but not interfere with the metering process. This will require secured enclosure technology to protect the metering infrastructure and reticulation. In order to be truly effective there will have to be real-time alerting of monitored enclosure and remote management in order to respond to conditions of criminal abuse. Using secure enclosures will also allow any minimum or allocated usage modes to be supported i.e. low cost power to a school or institution (or similar concessions)

Demand Side Management (Equalize load based on Capacity)

Remote control of supply of services to consumer will allow load to be balanced when required or even shutoff in the event of a regional disaster or as required for maintenance. This can be done individually, grouped or under regional control

Safety (Professional approach to service delivery)

No exposed power due to effects of vandalism and theft and the danger to the community of a breached enclosure. A practical system will provide alerts if secure enclosure opened without permission and continue to track such access until resolved

The Power Process Solution

iControl Overview

The iControl™ is a true web based, distributed, secure client-server solution that is designed to manage public infrastructure and to be deployed in public environments where traditional solutions suffer from tampering or vandalism.

The solution can additionally be used where ever a remote location needs to be environmentally monitored and access controlled.

The solution uses a sophisticated centralized, web based, management system that is highly scalable and provides data redundancy as standard.

All access to system and consumer/user data is secured behind state of the art firewalls and domain security. All operator and administrative access is through secure web connections either over the internet or via private network connections.

Our communication enabled iMon™ remote units, use GPRS, wired or fibre optic connections to report and receive data from the central iControl™ system services. The communications are encrypted and audited to ensure that intrusion or impersonation cannot take place within the solution network. Unique identifiers are used to manage devices and to enable operators to view them with a defined structure as well as geographical mapping to identify each device's location. All activity on each device is logged to an audit trail so that this data is available to operators.

Access to any iMon™ managed enclosure is via securely encoded key tags that provide access to one or more doors. Each door can be individually access controlled based on permissions derived from each key tag. This managed access control is enabled via our centralized key management process.

All events, such as door access, high temperature, tampering etc. are logged locally and also sent the iControl systems for analysis and action.

The system analyzer constantly monitors all events and will raise alerts to appropriate personnel via SMS, email, display boards or other methods as required.

iControl Components

The centralized iControl™ solution is composed of major components:

Central operations

1. Data collection
2. Device browser
3. Device status display
4. User data access
5. End user view

Reporting services

1. Aggregated overviews
2. Detailed reporting
3. Custom data extraction

Alerting services

1. Event monitoring
2. External alert generation

Administration system

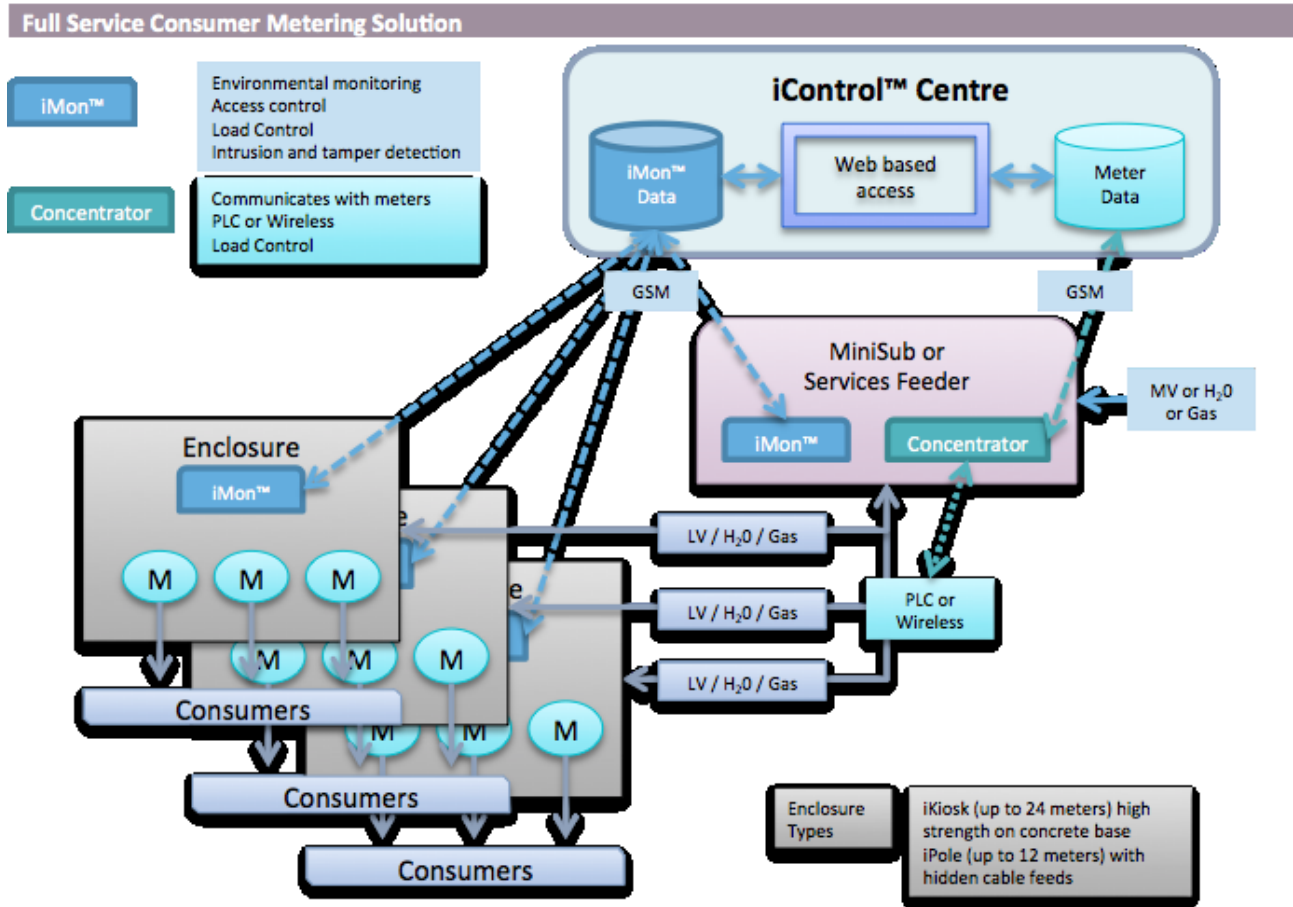
Customer management

1. User management
2. Key tag management
3. Device activation / deactivation

Security services

1. System access control
2. Data and firewall control
3. Device data access control
4. Intrusion monitoring

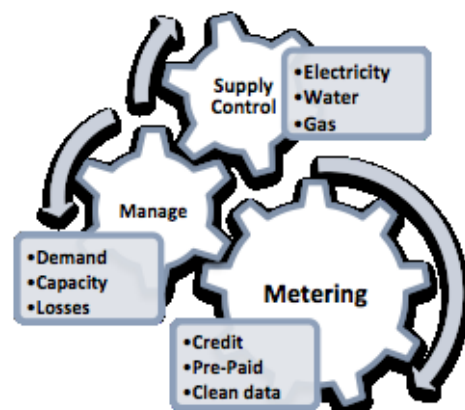
iControl™ is only available in a secure high capacity, centralized solution for high performance, backup and monitoring. The cost model is based on a monthly service fee and this will include all system updates and releases while subscribed.



iControl Overview

iControl Features

- High security, remotely monitored enclosures:
 - Supply metering of Electricity, Water or Gas
 - Expensive or sensitive equipment
 - Financially sensitive service provision
 - Community based services such as internet provisioning
 - Control systems for public safety
- Local and remote access control to enclosures
- Secure access controlled solution software platform
- Web based access for operations and management of the solution
- Customized reporting of devices and status of endpoints
- Protected data access through private data networks
- Scalable solution that supports both scale up and scale out.
- Capability of controlling thousands of endpoints
- All events securely logged for audit purposes
- Flexible endpoint monitoring configuration
- Two-way communication with real time performance - allows reading and controlling of any meter or managed endpoint in seconds
- Environmental management of endpoint enclosures
- Remote disconnect/connect and power limitation via internal relays or valves
- Setting of Consumption limits.
- Continuous loss analysis monitoring and alerting.
- Automated tamper and theft detection including:
 - cover/door open
 - terminal cover access
 - neutral current detection
 - elevated heat and noise
- Load shedding based on real time measurement
- Load management through peak leveling and peak shifting
- Customer selected credit or prepayment system



- Remote setting of any meter between credit mode and prepayment. (Meter dependent)
- Power outage detection and mapping
- Remote Time of Use (TOU) setting with multi-tariff pricing
- Remote meter firmware upgrade.
- Open for integration with other applications such as billing, CRM and DMS systems.
- Open protocols and full interoperability and standards – the ability to connect compliant third party meters into our system
- Meters comply with all IEC and MID standards.
- Automatic Alarms and alerts based on thresholds
- Bi-directional metering for co-generation capability
- Active, Reactive pF and frequency measurement
- Voltage and current event logging
- Digital inputs and outputs for functional extensions
- Multi-product metering

* Some features are Meter OEM dependent

Products in this range

The iKiosk and iPole are secured enclosures to house consumer level meters. The units are manufactured from 6 mm Mild or 3.5 mm 3CR12 Steel and all components are Laser cut or NC punched.

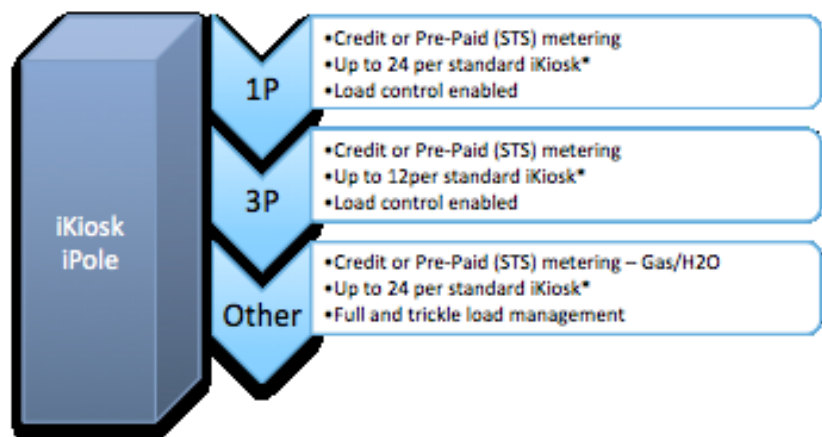
There are sensors on each door to track access as well as comprehensive anti tamper sensing systems. The enclosures have temperature and vibration sensors.

We can provide an optional 30Mpa custom designed plinth with stabilizers for high impact resistance and “pull over” and “tilt” prevention.

iKiosk units have isolation of MV and LV access points with separate doors for access. There are sensors on each door to track access as well as comprehensive anti tamper sensing systems. The enclosures have temperature and vibration sensors.

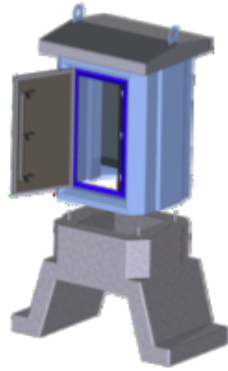
All equipment used within the kiosk (meters, circuit breakers and terminals) are touch safe i.e. have enclosed terminals, recessed screws etc. and comply with clause 8.2 of IEC 60898, which states all the requirements for equipment to be touch safe. The enclosure itself is IP 55 rated (no access to live contacts or water jet/spray penetration). All enclosures are manufactured to SABS 1973-3:2008 and as such carry this mark.

* Powered by iMon™ controller



iKiosk

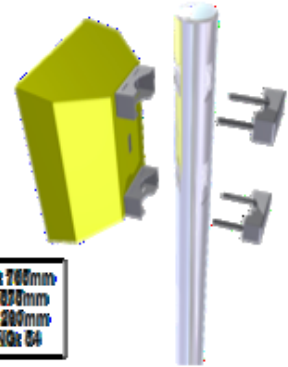
Ground mounted
tamper proof enclosure



Height: 950mm
Width: 790mm
Depth: 645mm
IP RATING: 54

iPole

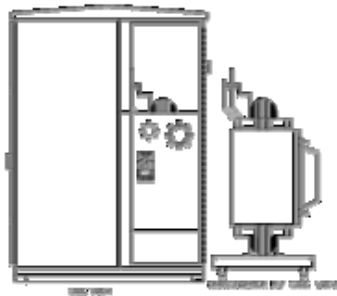
Pole mounted
tamper proof enclosure



HEIGHT: 700mm
WIDTH: 350mm
DEPTH: 200mm
IP RATING: 54

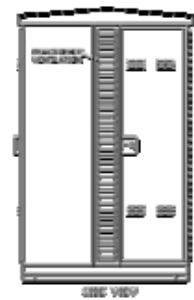
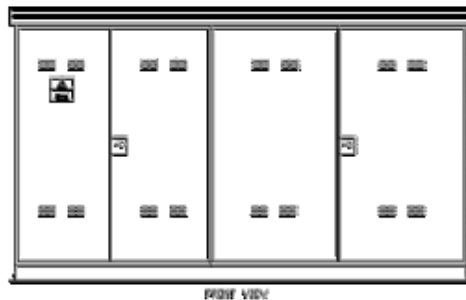
iRingM

Ground mounted tamper proof Ring Main enclosure



iMiniS

Ground mounted tamper proof Mini Substation enclosure



Product views

